

APPENDIX A

Air Weather Service

The US Air Force Air Weather Service (AWS) provides operational weather service support, as described in AR 115-10 and AFR 105-3. A supporting Air Force weather unit will be assigned to all corps and divisions and to separate brigades, regiments, and groups on request. Assignment is subject to the following:

- When requested in peacetime in accordance with AR 115-12 and in wartime as stated in contingency, mobilization, and war plans.
- When it is jointly agreed that remote weather service will be inadequate.
- When consistent with jointly agreed tactical doctrine and operational support concepts.

Planning and executing a successful operation require timely and accurate weather information. To ensure prompt receipt of weather information and to ensure that both the meteorologist and the NBC officer understand what is required, close and continuous coordination is essential. The NBC officer should establish (through the intelligence officer) and maintain direct contact with the AWS detachment or staff weather officer (SWO) before, during, and after operations.

SWOs can provide the following services:

- Weather observations. Under field conditions, the SWO will not be able to establish a dense observational network. There will usually be areas of concern for which no observations are available. Therefore Army personnel should also be prepared to provide supplemental observations to the AWS weather unit. The SWO also should have access to observations and upper air soundings from artillery meteorological (arty met) units to further supplement weather collection efforts.
- Forecasting services. These services, which can vary considerably, are provided according to local arrangements with the SWO.
- Climatological data (weather history). This planning information can be obtained from the SWO. Those units without an SWO should obtain it from the USAF Environmental Technical

Applications Center, Scott AFB, IL 62225 (see DA Pamphlet 115-1).

The dissemination of weather information within Army units is the responsibility of the intelligence officer. The AWS detachment or staff weather officer can supply information directly to the using agency, or the information can be routed through the intelligence officer for dissemination to staff and lower units. The intelligence officer determines the method to be used.

AWS operational support products are defined in terms of long-range planning (usually beyond 48 hours), mission planning (usually 24 to 48 hours), and execution support (usually 0 to 24 hours). For forecast periods in excess of five days, climatological analyses normally are provided. (NOTE: The forecast reliability decreases and the forecast provided becomes less specific as the forecast period increases. Significant changes or modifications may occur after the forecast is issued. The requestor must then inform the AWS facilities of the criteria for significant changes.)

The following observation and forecast parameters and elements are normally available; however, additional products may be provided, depending on Army stated requirements and the AWS's ability to satisfy those requirements:

- Sky conditions, including amounts (tenths in CONUS and eighths overseas), type (according to standard classification), and cloud base height (in feet).
- Precipitation and/or obstructions to visibility, including intensity, type, and times of beginning and ending (in coordinated universal time and zone Z).
- Surface visibilities in statute miles and fractions.
- Surface wind direction and speed.
- Surface temperature.
- Temperatures and winds at desired standard levels above the surface.
- Humidity.

Prior to planning an operation, the target analyst should collect AWS climatic studies, other

climatological data, and/or forecasts for the operational area valid for the time of the operation. To obtain maximum weather forecast assistance, the NBC officer must provide the AWS facility complete requirements as far in advance as possible. The request should include the following:

- Time period for the forecast and desired delivery time.
- Target or area to be covered by the forecast. Clearly identify an area by map coordinates, aerial photograph grid numbers, or established geographic boundaries.
- Special elements or conditions to be covered.
- Criteria for changes (amendments) in the forecast if desired.

If possible, supplementary forecast information should be obtained from the AWS facility prior to the release of agents when observations indicate the original forecast to be significantly in error; when the release time is appreciably delayed; or when, for any reason, the forecast requires updating.

The target analyst should also evaluate forecasts received. The analyst should use a detailed reconnaissance map, an aerial photograph, or a mosaic or study of the terrain and vegetation in and around these areas and those that might affect the behavior of the agents to be released.

After the operation, the NBC officer should pass to the intelligence officer, SWO, or AWS facility information on adequacy of support and any problems encountered. This information aids AWS forecasters in better tailoring future support.

Using agencies receive weather information in five general types of reports—weather forecasts, current weather observation reports, weather summaries, climatic summaries, and climatic studies.

A weather forecast is a prediction of weather conditions at a point, along a route, or within an area for a specified period. The accuracy and reliability of weather forecasts depend upon factors such as characteristics of the forecast area, age of the data available, reliability of weather communications facilities, length of the forecast period, state of meteorological science, and experience of the forecaster. The reliability and specificity of forecasts generally decreases as the forecast period increases. Also, the forecast

becomes less specific as the forecast period increases.

Routine weather forecasts for use by troop units should be in plain language and should be as accurate as possible. Forecasts are Air Weather Service operational support products. These forecasts are defined in terms of long-range planning (usually beyond 48 hours), mission planning (usually 24 to 48 hours), and execution support (usually 0 to 24 hours). Figures A-1 and A-2 provide an example of a sample forecast containing information elements that could be provided by Air Weather Service or Fleet Weather Service and supporting artillery meteorological sources.

Current weather observation reports are oral, written, or graphic representations of existing weather conditions or specific weather elements. These reports are used in the operation of aircraft; in the employment of nuclear weapons, chemical agents, and smoke; and in other activities.

A weather summary describes the weather along a route or within an area during a specified recent period. Weather summaries are used in analyzing the effects of weather on recent operations. These summaries are also used in estimating the effects of weather on future operations.

Climatic summaries tabulate averages, extremes, and frequencies of weather elements or phenomena. These cover a specified period—a year, season, or month—and a given point, along a route, or within an area.

Climatic studies are analyses and interpretations of climatic summaries. Corps and higher headquarters usually prepare these studies. At the request of the intelligence officer, the supporting AWS unit prepares or obtains climatic studies on specific problems for given areas.

Care must be taken to understand the meanings of the technical terms used in this manual. Some of these terms have a strict technical definition that may be different from the definitions many laymen understand.

Field behavior of NBC agents and smoke depends upon weather variables, which are wind, temperature, vertical temperature gradients, cloud cover, humidity, and precipitation. Local topography, vegetation, and soil affects these variables. The cumulative effect of these variables

OPERATIONAL
NBC WEATHER FORECAST/OBSERVATION
(Available Data From Air Weather Service, Fleet Weather Service and
Artillery Meteorological Sources)

1. Area forecasted _____ Date 16 Jan 86 Time of forecast (T f) 1200Z
 Division 82D
 (Other) _____

	Time			
	T f	T f + 3 hr	T f + 6 hr	T f + 24 hr
2. Wind (surface speed 5 knots)* Direction from (10° azimuth)*	05/360	10/360	15/290	10/270
3. Temperature gradient-- stable, neutral, unstable (vertical between 1.0 and 4 meters)**	NEUTRAL	NEUTRAL	NEUTRAL	NEUTRAL
4. Height of inversion Bases and tops to 1,000 ft altitude**	6000	6000	6000	7000
5. Temperature (5°F at 1.0 meter level)*	70	65	65	60
6. Relative humidity (10%)	80	90	90	85
7. Precipitation (rain or snow) (light, moderate, heavy); depth of snow	LT RAIN	LT RAIN	LT RAIN	LT RAIN
8. Cloud cover (clear scattered, broken overcast) height: low (below 6,500 ft); middle (6,500 to 20,000 ft); high (over 20,000 ft)	LOW OVC	LOW OVC	LOW OVC	LOW OVC

9. Fallout winds (T f thru f + 6 hr) **

Direction and Speed

(10° and 5 knots)*

Altitude (1,000-ft units)

Feet	Meters	Feet	Meters
5 _____	1.5 _____	55 _____	16.5 _____
10 _____	3.0 _____	60 _____	18.0 _____
15 _____	4.5 _____	65 _____	19.5 _____
20 _____	6.0 _____	70 _____	21.0 _____
25 _____	7.5 _____	75 _____	23.5 _____
30 _____	9.0 _____	80 _____	24.0 _____
35 _____	10.5 _____	85 _____	25.5 _____
40 _____	12.0 _____	90 _____	27.0 _____
45 _____	13.5 _____	95 _____	28.5 _____
50 _____	15.0 _____	100 _____	30.0 _____

10. Height of tropopause 20,000 Feet/or _____ Meters

* Rounded to the nearest increment

** AWS/FWS does not routinely provide this information. Artillery meteorological sections normally provide the upper wind data. The chemical downwind message (CDM) can also provide other weather information such as the air stability category.

Figure A-1. Sample forecast format (front).

NBC WEATHER PLANNING FORECAST

Valid (T f + 3 hr through T f + 24 hr): 860606 / 1500Z to 860607 / 1500Z
(date/time)

1. Surface wind
(same parameters as preceding format)

2. Vertical temperature gradient

Stable () Neutral (X) Unstable ()

Time: _____ / _____ / _____ / _____ / _____

3. Temperature

Maximum 70 °F at 860606 / 1500Z; Minimum 60 °F at 860607 / 1500Z
(Time) (Time)

4. Relative humidity

Maximum 90 % at 860606 / 1500Z; Minimum 85 % at 860607 / 1500Z
(Time) (Time)

5. Cloud cover

Clear () Scattered () Broken () Overcast (X)

6. Precipitation

No () Yes () Rain (X) Snow ()

Beginning 860606 1500Z
(Time)

End 860607 1500Z
(Time)

7. Fallout winds

Significant changes?

No (X)

Yes (), as follows:

	Feet	Meters	Feet	Meters
(Direction and speed as	10 _____	3.0 _____	40 _____	12.0 _____
in preceding format)	20 _____	6.0 _____	50 _____	15.0 _____
	30 _____	9.0 _____	60 _____	12.0 _____

8. Height of tropopause 20,000 Feet/or _____ Meters

Figure A-2. Sample forecast format (back).

governs the required quantity and optimum type of chemical agent and smoke best suited to achieve operational objectives. Since weather governs the transport of chemical agents and smoke clouds, it is a primary factor in determining the effectiveness of a specific agent and the extent of the hazard area.

You must understand the basic principles governing weather and have access to accurate forecasts to be able to use chemical agents

effectively or to defend against their use by the enemy. You must be capable of using the data provided in weather forecasts and predictions in preparation of plans and estimates. Appendix C discusses weather elements and primary weather factors in further detail for you to work with your forecaster on how best to employ chemical agents, smoke, and other obscurants, or defend against NBC agent use.